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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,305	03/23/2001	Toshiaki Hongo	P 0279274 EL01001CDC	4649
909	7590	02/23/2005	EXAMINER	
PILLSBURY WINTHROP, LLP			ALEJANDRO MULERO, LUZ L	
P.O. BOX 10500			ART UNIT	PAPER NUMBER
MCLEAN, VA 22102			1763	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,305

Applicant(s)

HONGO ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/7/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-43 is/are pending in the application.
- 4a) Of the above claim(s) 33-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-32 and 37-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restriction

Claims 33-36 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/28/02. Note that the claims are similar to the claims of previously non-elected Group II.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26, 28-30, 37, and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al., U.S. Patent 5,772,771.

Li et al. shows the invention as claimed including a plasma processing apparatus for applying a plasma process to an object 20 to be processed, the plasma processing apparatus comprising: a process chamber 2 in which the object to be processed is subjected to the plasma process; a plasma source 26 that generates plasma; a gas introducing portion configured to introduce a gas into the process chamber; a first vacuum device connected to the process chamber so as to evacuate gas from the process chamber; a second vacuum pump 84 connected to the outlet port, wherein the gas introducing portion comprises: a plurality of gas nozzles 34; an inlet port 80 through which the gas is introduced into the gas nozzles; an outlet port 82 through which the gas is evacuated from the gas nozzles (see figs. 1, 4-5 and col. 3-line 20 to col. 5-line 37).

Li et al. fails to expressly disclose the outlet port through which the gas is evacuated through the nozzles having a diameter larger than a diameter of the gas nozzles and a gas-evacuating arrangement comprises a bypass passage which connects said outlet port to the first vacuum pump by bypassing said process chamber. Regarding the relative diameter of the gas nozzles and outlet port, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the outlet port at least the same size as the inlet port because in such a way the exhaustion of the gas can be efficiently optimized. Furthermore, it also would have been obvious to one of ordinary skill in the art at the time the invention was made to have the inlet/outlet port having a bigger diameter than the gas nozzles because this will allow for the gas to be efficiently distributed through the gas nozzles and into the chamber and it would

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generate a uniform gas pressure distribution through the nozzles-type gas supply system. Moreover, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Furthermore, with respect to the bypass passage which connects said outlet port to the first vacuum pump by bypassing said process chamber, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the second vacuum pump of the apparatus of Li et al., with a bypass that connects to the first vacuum pump so as to reduce the overall size and complexity of the apparatus.

Concerning claims 28-29 and 39-40, note that in Li et al. the gas introducing portion includes an annular gas passage 36 through which the gas flows that is connected to the inlet port, the outlet port, and the gas nozzles, the gas nozzles located along the annular passage at substantially equal intervals (see fig. 4).

With respect to claims 30 and 41, note that the gas introducing portion can include first and second gas introducing portions configured to supply first and second gasses, respectively (see fig. 4).

Claims 27 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al., U.S. Patent 5,772,771 as applied to claims 26, 28-30, 37, and 39-41, and further in view of Tomoyasu et al., U.S. Patent 5,900,103.

Li et al. is applied as above but does not expressly disclose the claimed showerhead type structure. Tomoyasu et al. discloses an apparatus comprising a gas introducing part comprising a showerhead type structure 780a/780b/780c provided on a top of said process chamber so as to introduce the reactant gas from the top of said process chamber, a gas passage 770 being formed between said dielectric plate and said shower plate so that the reactant gas flows through the gas passage and is introduced into said process chamber through said shower plate. Additionally, Tomoyasu et al. also shows wherein the dielectric plate has an inlet port connected to said gas passage so as to supply the reactant gas to said gas passage, and said gas passage has an outlet port to which a gas-evacuating arrangement is connected (see, for example, fig. 37 and its description). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Li et al. as to further comprise the claimed showerhead type structure because in such a way the process gases can be uniformly introduced into the processing region to the substrate.

Claims 26-32 and 37-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei et al., 2002/0011215 A1 in view of Tomoyasu et al., U.S. Patent 5,900,103 and Li et al., U.S. Patent 5,772,771.

Tei et al. shows the invention substantially as claimed including a plasma processing apparatus for applying a plasma process to an object to be processed, the plasma processing apparatus comprising: a process chamber 101 in which the object

to be processed is subjected to the plasma process; a gas introducing portion configured to introduce a reactant gas into said process chamber and including a shower plate 106 provided on a top portion of said process chamber so as to introduce the reactant gas from the top of the process chamber through a plurality of apertures facing the object to be processed, and a first vacuum device connected to said process chamber through an exhaust port 102 so as to evacuate a volume inside the process chamber (see fig. 1 and paragraphs 0061-0077). Furthermore, Tei et al. discloses additional embodiments with a slot antenna having a plurality of slits so as to guide a microwave having a predetermined frequency and where the density of slits is substantially uniform in a radial direction of said slot antenna (see paragraphs 103-108).

Tei et al. fails to expressly disclose a plurality of nozzles, an inlet port through which the gas is introduced into the nozzles, an outlet port through which the gas is evacuated from the gas nozzles, the outlet port having a diameter larger than a diameter of the gas nozzles, and a second vacuum device connected to the outlet port. Tomoyasu et al. discloses a gas outlet port 750A (see Fig. 37) connected to a gas-introducing part so as allow the gas to be exhausted from the gas passage. Furthermore, Li et al. discloses a gas introducing structure comprising: a) a plurality of gas nozzles 34 b) an inlet port through which the gas is introduced into the nozzles, and c) an outlet port 82 provided to the gas passage and comprising a vacuum device 84 to evacuate a volume inside the gas introducing portion (see figs. 1, 4-5, and col. 3-line 20 to col. 5-line 37). Therefore, in view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the

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apparatus of Tei et al. so as to include the gas introducing structure of Tomoyasu et al. and Li et al. because this will allow for efficient gas distribution into the processing chamber and also enhanced cleaning of the nozzles. Additionally, the relative diameter of the gas nozzles and outlet port, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the outlet port of the apparatus of Tei et al. modified by Tomoyasu et al. and Li et al. to be at least the same size as the inlet port because in such a way the exhaustion of the gas can be efficiently optimized.

Furthermore, it also would have been obvious to one of ordinary skill in the art at the time the invention was made to have the inlet/outlet port having a bigger diameter than the gas nozzles in the gas introducing structure because this will allow for the gas to be efficiently distributed through the gas nozzles and into the chamber and it would generate a uniform gas pressure distribution through the nozzles-type gas supply system. Moreover, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Tei et al., Tomoyasu et al. and Li et al., fail to show wherein said gas-evacuating arrangement comprises a bypass passage which connects said outlet port to the first vacuum pump by bypassing said process chamber. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the second vacuum pump of the apparatus of Tei et al. modified by Tomoyasu et al. and

Li et al., with a bypass that connects to the first vacuum pump so as to reduce the overall size and complexity of the apparatus.

Response to Arguments

Applicant's arguments filed 1/7/05 have been fully considered but they are not persuasive. Regarding the relative diameter of the gas nozzles and outlet port, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the outlet port at least the same size as the inlet port because in such a way the exhaustion of the gas can be efficiently optimized. Furthermore, it also would have been obvious to one of ordinary skill in the art at the time the invention was made to have the inlet/outlet port having a bigger diameter than the gas nozzles because this will allow for the gas to be efficiently distributed through the gas nozzles and into the chamber and it would generate a uniform gas pressure distribution through the nozzles-type gas supply system. Moreover, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-

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1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luz L. Alejandro
Primary Examiner
Art Unit 1763

February 22, 2005